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- (54) **RIDE VEHICLE MOUNTED INTERACTIVE GAME SYSTEM**
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- (52) **U.S. Cl.**
CPC *A63F 13/06* (2013.01)
- (58) **Field of Classification Search**
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See application file for complete search history.

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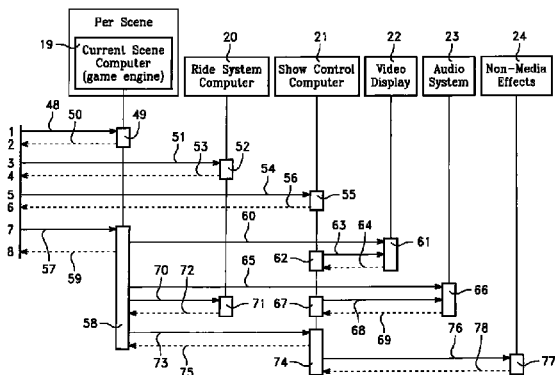
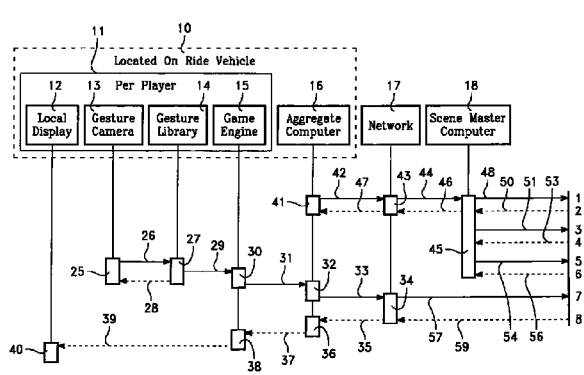
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(57) **ABSTRACT**

A unique combination of amusement park attraction ride vehicles with gesture-based game controllers to create a new form of interactive amusement ride, where on-board game displays, cameras and gesture recognition software for each of a plurality of riders, capture rider gestures and convert those gestures into signals that are inputs to, and affect, the interactive experience or game elements of the attraction.

4 Claims, 2 Drawing Sheets



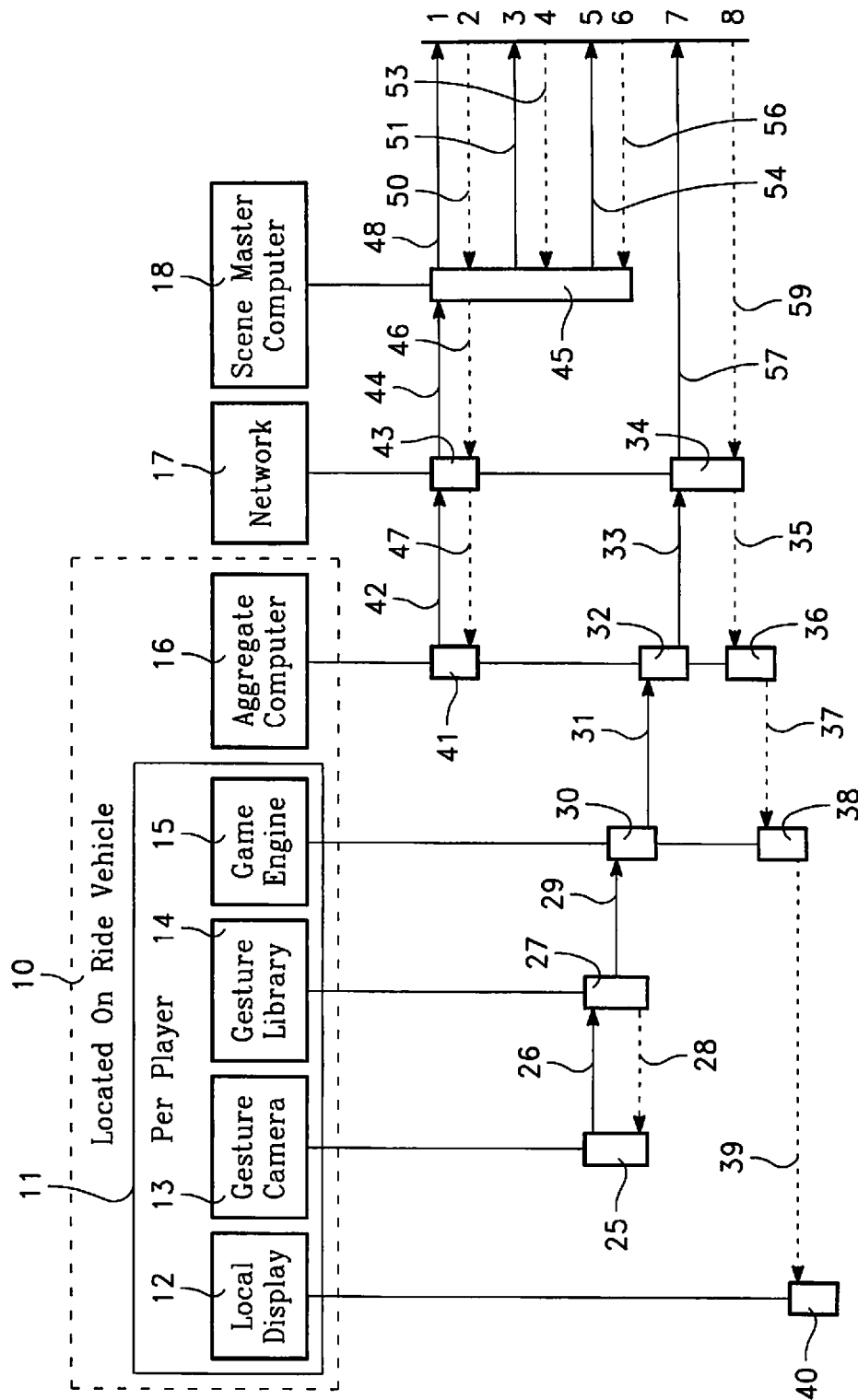


FIG. 1A

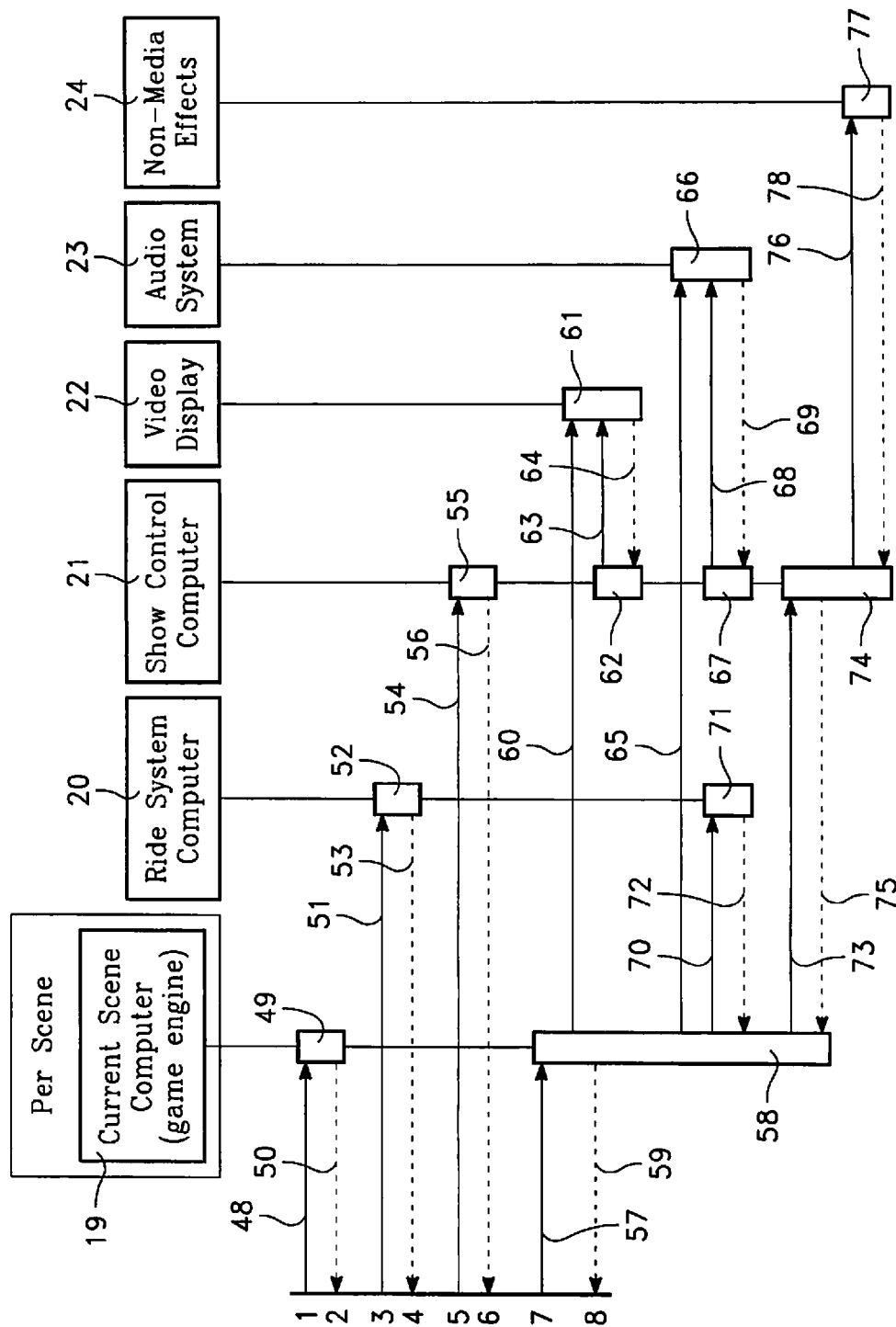


FIG. 1B

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RIDE VEHICLE MOUNTED INTERACTIVE GAME SYSTEM

A unique combination of amusement park attraction ride vehicles with gesture-based game controllers to create a new form of interactive amusement ride, called, in one embodiment, a Gesture-based Interactive Dark Ride (GIDR or “Guider”). GIDR uses small on-board cameras and gesture recognition software inside the ride vehicles, in which riders use their hands and body movements to interact with off-board media and ride scenes. The resulting ride system is a unique, immersive, and intuitive experience where riders interact directly with the attraction in a way that works like the gesture-based technologies in home game consoles (X-Box Kinect) and museum interactives (GestureTek, Snibbe Interactive). Unlike existing interactive, game-based, or shooting gallery-style dark rides, GIDR need not use laser guns or other physical controllers and need not align with off-board sensors.

An attraction is defined here as an amusement or theme park ride that may include an automated ride system with multiple vehicles (dark ride, endless chain, boat ride, spinning ride, or roller coaster) and supporting scenery, lighting, animatronics, special effects, game elements, video, and audio to support the story of the ride.

A small camera and infrared (IR) emitter may be placed/embedded on a ride vehicle body, e.g., in front of each rider/player. The system’s sensors, meaning the emitter and the camera, may be small and low-profile, facilitating their addition to existing ride vehicles. The new system’s sensors are individually aimed at each rider, so a rider’s play is never obstructed, whatever vehicle row they occupy. This gesture recognition system is on-board a ride vehicle, traveling with the rider. This means that while a rider is on such a vehicle, the system/game can be interactive, and need not wait for the vehicle to arrive at a prescribed location, or to align to media.

Each vehicle in an attraction will have an independent set of on-board sensors for each of its riders. On-board systems for each vehicle collect gesture data and transmit it to off-board scene-based systems. A scene may include a single room, that may be occupied by one vehicle at a time. The game or interactivity processing takes place entirely off-board in the scene systems. On-board sound effect triggers and any on-board displayed data, like scoring information, is transmitted back to the vehicle from such off-board systems.

As vehicles travel from scene to scene throughout a ride, an off-board master computer will direct communication between each on-board vehicle system and one of many off-board scene systems, creating the appropriate interactivity for that vehicle’s presence in that scene. When a first vehicle (or sometimes group of vehicles) moves into a first scene, a master computer connects those vehicles to that scene only for the duration of that scene. Once completed, the vehicle or group moves to a second scene and is connected by the master computer only to that scene. At the same time, a new vehicle or group may have moved into the first scene and been connected. This same vehicle to scene connection process occurs simultaneously with all scenes and vehicles throughout the attraction, preferably on a continuous cycle.

This system is not ride manufacturer dependent or ride platform dependent. The system should work well with slow moving dark rides, endless chains, boat rides, spinning rides, and roller coasters.

Rider/player gestures may change/vary from one installation to another depending on the game or experience. They

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may also change during the course of a single ride. Example gestures and their uses include but are not limited to:

Throwing—As riders mimic a throwing action, GIDR may generate images of a virtual thrown object in off-board media with the desired trajectory/velocity for that hand movement.

Shooting—A rider may mimic a gun with their hand/fingers and fire using a thumb gesture.

Waving—A rider’s motions may guide movement of objects in off-board media. Such motions could, for example, row/steer a virtual boat, keep a virtual balloon aloft, or guide an object to a target.

Grabbing/Collecting—With appropriate motions, a rider may guide an avatar to catch and retain objects in a virtual environment.

Swatting/Blocking—Using an appropriate hand movement/gesture, riders may defend themselves, or protect an avatar, from moving or stationary objects in off-board media.

Swaying/Dodging—Two or more riders may move/lean to dodge objects in off-board media. Moving ride vehicles may also move/tilt in response to rider movements.

Slingshot—Using a pinching motion, a rider can pull back the band on a virtual slingshot and release, sending a media-based projectile towards targets in the scene.

Driving—GIDR, including the ride system, may react/respond to rider movements. For example, a trackless ride vehicle may be guided, in part, by a rider turning an imaginary steering wheel.

Signals/Symbols—Puzzle-based games may be played using gestures that represent keys and ciphers.

Sign Language—Because of the hand tracking technology, the GIDR could respond to simple sign language hand movements, providing participation opportunities to hearing-impaired riders.

Cooperative Play—The system provides for cooperative play by riders working together. Game play may include different roles for two or more riders who must work together to accomplish a goal.

Self-Adjusting/Handicapping—The system may automatically detect the presence and position of riders, automatically handicap children, or others, based on a metric such as player height, and/or adjust for a vehicle with one or more empty seats.

BRIEF DESCRIPTION OF THE DRAWING

The drawing is a sequence diagram for an embodiment of the invention, but the claims are not limited to this embodiment.

DETAILED DESCRIPTION OF THE DRAWING

The drawing shows a ride vehicle **10** that includes, for each vehicle rider/player, a local display screen **12**, a gesture camera **13** to capture a player’s gestures, a gesture library **14** of common player gestures for matching to a new player gesture perceived by camera **13**, and a local game engine **14** that passes gesture definitions and position data to an aggregate computer **16** that assembles/bundles all players’ gesture data to affect the current game scene **58**.

When a ride vehicle enters a scene, the scene master computer **18** and vehicle aggregate computer **16** coordinate **41-50** so that the correct current scene computer **19** knows which vehicle’s **10** gesture data **57** to respond to. The scene master computer **18** may need to communicate **51-53**, **54-56** with the ride system computer **20** and the show control computer **21** as the vehicle **10** enters the scene to activate the

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physical space as necessary for the experience. The scene master computer **18** will also monitor the ride system status **53** and show control status **56** for control coordination and error checking.

Video signals from the gesture camera **13** are ingested and analyzed **26** by the gesture library **27**. Gesture definitions and position data **29** are passed via the game engine **30** to the aggregate computer **32** where they are bundled with the other riders' data. The game data is passed to the correct current game scene **58** over the network **34**. Game data pertinent to the player is returned from the current game scene **58** over the network **34** to the aggregate computer **36** to each rider's game engine **38** for local display **40** to the rider.

The game **58** running on the current scene computer **19** is affected by the bundled gesture data **57** from all riders on the vehicle **10**. The game "world" is represented using video displays **22**, audio systems **23**, and other, non-media, show action equipment **24** (lighting, animatronics, etc) as dictated by the experience's story. Maintenance, operations, and game-specific interactions **61-64**, **66-69**, **76-78** for the video **22**, audio **23** and non-media **24** systems originate with the show control computer **21**.

All actions may be occurring between several vehicles within several scenes concurrently.

What is claimed is:

1. A combination of amusement park attraction ride vehicles

with gesture-based game controllers to form an interactive amusement ride including a ride vehicle mounted interactive system including ride-mounted game displays, cameras and gesture recognition software for each of a

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plurality of riders that capture rider gestures, and convert said gestures into signals that are inputs to, and affect, said ride-mounted game, wherein each of the ride vehicles has a gesture control camera installed within the vehicles for each rider; further comprising, for each vehicle, an on-board computer to aggregate a plurality of rider gestures for input to said interactive ride's off-board computers.

2. The system of claim **1** further comprising an off-board master computer to connect vehicle gesture data with multiple off-board scene computers, in order to allow interactivity between riders and the surrounding attraction.

3. A combination of amusement park attraction ride vehicles

with gesture-based game controllers to form an interactive amusement ride comprising, for each rider, a game display device, a camera to capture rider gestures, a gesture library to analyze and identify a rider's gestures, and a computer to aggregate a plurality of rider gestures for input to said game and for display of changes to the game resulting from the input, wherein each of the ride vehicles has a gesture control camera installed within the vehicles for each rider; further comprising, for each vehicle, an on-board computer to aggregate a plurality of rider gestures for input to said interactive ride's off-board computers.

4. The system of claim **3** further comprising an off-board master computer to connect vehicle gesture data with multiple off-board scene computers, in order to allow interactivity between riders and the surrounding attraction.

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